have led to the conclusion that Bidwell's theory as to the important rôle of the selenides is unsatisfactory, and that the conductivity depends almost wholly upon the metallic selenium formed throughout the amorphous modification when heated to a temperature of about 200° C. Hesehus has developed an interesting theory of the "allotropic dissociation of selenium," which, on the whole, explains satisfactorily the behavior of the cells.

(3) The constants of the cell must change only little in time, with temperature and atmospheric conditions; but, in this respect also, the selenium cell is by no means perfect. A sensitive cell has a granular structure with numerous minute pores and interstices between the granules, doubtless due to the fact that with the transformation of the amorphous modification to the metallic, which latter has a considerably larger density, irregular contraction will occur and cracks be formed. Expansion caused by an increase of temperature will be followed by a closer electrical contact between the granules and a lowering of resistance. In some cases this temperature effect is very large and it differs in cells of different construction.[10] Carpini[11] found that on heating a cell through 80° or 90° C. the resistance dropped to almost one-tenth of its original value, an enormous change which may, however, in part be due to some transformation into the conducting modification.

Increase of external pressure will also decrease the resistance, as Brown[12] has shown.

Moisture absorbed by the pores doubtless influences the electrical conductivity and thus necessitates the use of a vacuum chamber for the cell.

If I add to this that in course of time the sensitiveness changes, that the contact between the selenium and the electrodes often loosens, and that there is a very annoying after effect, i. e., that the action of the cell is quite sluggish, especially in its return to the original high resistance after the light is shut off, it is apparent that we have not as yet a cell which can be used with any degree of satisfaction for the measurement of intensity of illumination.[13]

Of course it is a different matter if we wish to determine a definite instant at which a sudden change of illumination takes place, as Wulf and Lucas have done in their investigation in connection with the eclipse. It seems that they were able to determine accurately the exact time of first apparent contact of the sun's and moon's disks as well as the end of totality; but only the most sanguine admirer of the selenium cell would dare to draw any conclusion as to the actual change of intensity from the curve given by these investigators, even if we suppose that all spectral colors from the sun are diminished in the same ratio as the eclipse progresses.[14]

WEST INDIAN CHART.

Among the changes in the WEATHER REVIEW for 1906 many will note the absence of the chart of isobars and isotherms for the West Indies. This chart has been kept up in the hope that its usefulness might lead to some system of cooperation among the isolated West Indian services and stations, and eventually to the publication of more complete and satisfactory meteorological and climatological data. Such a union of effort has not yet been attained, but may be realized hereafter, and meanwhile we shall hope to publish occasional references to current sources of information.

The weather of tropical regions is popularly supposed to be very uniform from day to day and year to year, but for this very reason a slight change in temperature or moisture, sunshine or rainfall, has a disproportionately large influence on plants and animals. The large changes that we experience in temperate zones would be disastrous in the Tropics. The regular publication of continuous meteorological details, as well as the different charts for the West Indies, is as important to the student as are the similar publications for the United States. In fact, however, their value to biological studies is not the most important argument for the publication of such monthly charts. The changes in location of the general or tropical areas of high and low pressure, wind, and rain that produce variations in West Indian weather are undoubtedly due to great changes in the general atmospheric conditions over the whole globe. Storms form as the result of these conditions, and we need a daily chart of the West Indies and adjacent regions, with weekly and monthly synoptical charts, such as Hildebrandsson has published, showing the departures from normal, in order to realize the intimate relation between the equatorial and the polar oscillations.—*C. A.*

[10] Aiki and Tanakadate, Math. and Phys. Soc., Tokyo, 16, 217, 1904.
[11] Carpini, Lincei Rend. 14, 667, 1905.
[12] Brown, Phys. Rev. 20, 185, 1905.
[13] See also Dorsey, Monthly Weather Review, 27, 99, 1899, and Berthier, L'Ecl. electr., 38, 441, 1904.
[14] Schwarzschild and Villinger, Phys. Zeitschr., 6, 737, 1905.

PHENOLOGICAL STUDY.

E. N. Transeau, Professor of Biology, Alma College, Michigan, in acknowledging the receipt of a copy of Bulletin 36, says:

> Regarding phenological data I believe the Weather Bureau could secure sufficient data to publish a really valuable map and discussion of this interesting phase of plant geography. The data would have to be secured largely from amateur collectors, for so far as I know very little has been published along this line in this country. Data might also be obtained from herbarium specimens in the larger collections.

Phenology—considered as the study of the development of plants from one epoch to another throughout life—does not belong to meteorology, but to biology, and indeed requires the services of a skilled botanist. If this study should be well organized, under the proper division and bureau of the Department of Agriculture, then many Weather Bureau observers would doubtless be pleased to cooperate, but we can not take the initiative in this matter.—*C. A.*

BACK NUMBERS OF THE WEATHER REVIEW.

The editor will be glad to hear promptly from anyone who desires to complete his set of the MONTHLY WEATHER REVIEW, as it is possible that the accumulation of back numbers may now enable us to complete such sets.—*C. A.*

RESTRICTIONS ON PUBLICATIONS AND THEIR DISTRIBUTION.

In connection with the publication of the MONTHLY WEATHER REVIEW it is proper to remind our correspondents and recipients of the General Order (No. 96, April 14, 1906) recently issued by the Secretary of Agriculture:

> In view of the restrictions placed on the funds available for printing and binding for this Department, and in view of the constantly increasing demands upon these funds, it becomes necessary to adopt restrictive measures in regard to the issue of publications. It is quite as incumbent upon the Department to publish the information it has acquired as to conduct the laboratory work and field and other investigations by which this information is obtained. The only limit placed upon the acquisition or diffusion of this information is that it shall be of value to agriculture.[1] Four ways only seem available by which the expense of the printing and binding for this Department may be judiciously restricted:
>
> First, by prevention of the waste inevitably accompanying a general gratuitous distribution.
>
> Secondly, by careful editing (in the manuscript) of every document submitted for publication, with a view to presenting the facts in the briefest, most succinct style compatible with clearness.
>
> Thirdly, by rigid suppression of the tendency to reedit in the proof, and,

[1] Undoubtedly this is to be interpreted as including all the work of the Department of Agriculture.—EDITOR.